AMENDMENTS TO THE SPECIFICATIONS:

Please replace Paragraph [0057] of US Publication No. 2004/0145366A1 with the following amended paragraph:

[0057] FIG. 2a is a diagrammatic cross-sectional view of a tip of the microscope;

Please replace Paragraph [0058] of US Publication No. 2004/0145366A1 with the following amended paragraph:

[0058] FIG. 2b [[3]] is a scanning election microscope image of a pick-up coil for the microscope of FIG. 1;

Please replace Paragraph [0103] of U.S. Publication No. US 2004/0145366A1 with the following amended paragraph:

[0103] In order to obtain high spatial resolutions the sensor is placed in close proximity to the room temperature sample for some applications, typically at distances comparable to the spatial resolution. (See the Wikswo, et al. article). Hence the major challenges are to bring and maintain a close spacing between the sensor at low temperature (about 4.2 K) and the sample at room temperature. Therefore, the sensor is placed in the vacuum space behind a thin sapphire window. The sensor is maintained at cryogenic temperatures in the vacuum space in close proximity to the room temperature sapphire window. The sample is scanned in close proximity to the window. The instrument is magnetically shielded from environmental noise.

Please replace Paragraph [0104] of US Publication No. 2004/0145366A1 with the following amended paragraph:

[0104] Referring now to the drawings and more particularly to FIG. 1 thereof, there is shown a low-temperature SQUID microscope 10, which is constructed according to preferred embodiment of the invention. The microscope 10 includes a dewar 12 contains two stacked reservoirs 14 and 16. The lower reservoir 14 contains liquid helium and the upper reservoir 16 contains liquid nitrogen. The 3.2 liter

nitrogen tank or reservoir 14 is thermally linked to an aluminum radiation nitrogen shield generally indicated at 18 that surrounds the 1.9 liter helium reservoir 14 and extends downwardly to the tip or distal end 21 of the cryostat or cold finger 23, shielding the interior against thermal radiation from the surrounding walls. By having the shield 18 extend to the tip 21, a SQUID pick-up coil 24 is facilitated to be positioned in a closely spaced relationship to a room-temperature sample to be inspected. The nitrogen shield 18 is further wrapped in multiple layers of aluminized mylar superinsulation to reduce the thermal load due to radiation on the liquid nitrogen shield and therefore makes the operation of the sensor possible and also increases the hold time of the nitrogen contained in the reservoir. The helium reservoir 14 is supported by its fill tube 25, which provides a rigid mechanical connection to a top plate 27. Similarly, the nitrogen reservoir 16 ~~14~~ is attached to the top plate 27 by its fill tube, and a flexible brass bellows 29 is connected at the bottom of the reservoir to help avoid mechanical stress due to differential thermal contraction. To help add more mechanical stability to the nitrogen reservoir 16 ~~14~~ and the shield 18, there are a plurality of horizontal glass fiber rods such as rods 38 and 41. The heat load on the helium reservoir 14 imposed by the mechanical support structure is about 20 mW. The glass fiber rods contribute about 10 mW, and the fill tube 25 and nitrogen reservoir or tank 16 approximately 5 mW each.

Please replace Paragraph [0108] of U.S. Publication No. 2004/0145366A1 with the following amended paragraph:

[0108] Once the pickup coil 24 is superconducting and exhibits a response to the dc magnetic field, the white flux noise level may be about 4 .mu.0/Hz-1/2, indicating negligible noise contributions from the pickup coil 24 or surrounding metallic structures. The conical aluminum nitrogen shield extension 54 surrounding the pickup coil 24 may ~~may~~ include a plurality of longitudinally extending slots such as slots 56 and 58 (FIG. 2a), in order to prevent or reduce circular currents in the plane of the pickup coil. The cone extension 54 may be composed of aluminum material, or of a machined G-10 fiber-composite material, or coil foil. When composed of the G-10 fiber-composite material, thin copper strips may be

anchored to the lower part of the nitrogen shield. Calculations demonstrated that the Nyquist noise contribution (see the Clem article) of the cold finger, nitrogen shield, window mechanism, and cryogen tanks was less than the intrinsic noise levels of the SQUID apparatus coupled to the pickup coil.

Please replace Paragraph [0153] of US Publication No. 2004/0145366A1 with the following amended paragraph:

[0153] For the purpose of the experiment, the MCGs were acquired at 1600 locations on the surface spaced 400 .mu.m apart on a 16.times.16 mm.sup.2 grid with the stimulation electrode in the center of the grid. FIG. ~~12(b)~~ 11(b) shows a representative MCG taken at a location of the scanning grid. FIG. ~~12(a)~~ 11(a) shows the scanning area on the heart diagrammatically. As shown in FIG.11(a) ~~12(a)~~, the left ventricular free wall was chosen since the cardiac muscle fiber orientation is relatively homogeneous and straight although the fiber rotates by 90.degree. from the epi- to the endocardial surface over a depth of .apprxeq.3 mm.;

Please replace Paragraph [0155] of US Publication No. 2004/0145366A1 with the following amended paragraph:

[0155] The MCGs were combined to produce a time series of two-dimensional magnetic field maps spaced 1 ms in time. The magnetic field map during the cathodal stimulation is shown in FIG. 12 ~~13~~. The magnetic field clearly shows a octopolar pattern with the magnetic field pointing out of the page in quadrants I and III and with an opposite direction in quadrants II and IV. The peak field is about 2.3 nT and the fiber direction is along the x-axis of the image. A current pattern is overlaid on the magnetic field data to visualize qualitatively the currents during stimulation. To calculate the currents from the magnetic field maps, we made as a first-order approximation the assumption that the current distribution [10] is two dimensional. It is clear that the magnetic field is generated by four current loops of alternating directions, consistent with this assumption.

Please replace Paragraph [0156] of US Publication No. 2004/0145366A1 with the following amended paragraph:

[0156] The magnetic field maps at 1, 5, 11 and 17 ms after the stimulation are shown in FIG. 13~~14~~. The magnetic field maps after the stimulus shows a reversal in currents immediately after current injection and subsequently the generation and propagation of an elliptical action-current wave front pushing the four current loops outward. At times greater than about 8 ms the four loops begin to disappear and a dominant wave front forms in quadrant III and IV.